AIA Annual Engineering Key Contacts Meeting

Brief Update on Systems Engineering Revitalization

May 21, 2007

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Topics

- What's happening in:
  - Policy
  - Guidance
  - Education & Training

- What we're finding on programs
  - Top 10 emerging issues from Program Support Reviews
  - Trends from System Engineering Plan (SEP) reviews

New SE Policy in Draft DoDI 5000.2

- § 3.5.5. SE "shall be considered" during CR and TD.
- § 3.7.7. "System Design [phase of SDD] shall include the establishment of the functional, allocated, and product baselines for all configuration items."
- § 3.7.8. Proceeding beyond the CDR. "The system-level CDR provides an opportunity for mid-phase assessment of design maturity as evidenced by measures such as successful completion of subsystem CDR; the percentage of hardware and software product build-to specifications and drawings completed and under configuration control."
- § 3.7.9. System Demonstration. "The program shall enter System Demonstration when the program has successfully completed the system-level CDR and established a product baseline."
- § 3.10.5. Program Support Reviews. PSRs mandated for all MDAPs and ". . . shall be conducted prior to each milestone event, before approval of the SDD acquisition strategy, and at other times as directed by the USD(AT&L)."
- Enclosure 3. Table E3.T2: SEP is mandated at milestones A, B, and C.
- Enclosure 12. Systems Engineering. Includes new policy on CM, DM, and ESOH and previously approved SE and related policies.

Guidance

- What's available:
  - Systems Engineering Plan (SEP) Preparation Guide
  - Risk Management Guide for DoD Acquisition
  - DoD Guide for Achieving Reliability, Availability, and Maintainability
  - Integrated Master Plan/Integrated Master Schedule (IMP/IMS) Guide
  - Guide to Integrating SE into DoD Acquisition Contracts
  - Understanding and Leveraging a Supplier's CMMI Efforts: A Guidebook for Acquirers (new)
- What's coming:
  - Systems of Systems SE Guide
  - Update to SEP Preparation Guide
  - Update to Defense Acquisition Guidebook
    - Chapter 4 -- Systems Engineering
    - Chapter 9 -- Test and Evaluation

SEP Prep Guide

- ED released a draft SEP Prep Guide on April 27 for review by the SE Forum members and other SE personnel. *Comments are due to ED by June 8.*
- Adjudication of SEP Prep Guide comments after June 8
- Release of final SEP Prep Guide by June 30.

SEP Prep Guide

- New guide includes sections by program phase:
  - Technology Development
  - System Development & Demonstration
  - Production & Deployment and Operations & Support

- Each section is based on technical planning focus areas for that phase
  - Program Requirements
  - Technical Staffing
  - Technical Baseline Management
  - Technical Review Planning
  - Integration with Overall Management of the Program

DAG Chapter 4 Update

- ED released DAG Chapter 4 on April 27 for update by cognizant section owners. *Comments are due to ED by June 1*

- Adjudication of Chapter 4 updates after June 1

- Release of updated Chapter 4 to DAPWG for their review NLT Sep
  - Tied to the release of new policy in DoDI 5000.2

Education & Training

➢What's new

- On-line Continuous Learning Modules (CLMs): Reliability and Maintainability; Technical Reviews; Technical Planning; System Safety; Modeling and Simulation
- On-line introductory course SYS 101
- On-line intermediate course SYS 202
- Intermediate classroom course SYS 203
- Advanced classroom course SYS 302
- New "SPRDE/Program Systems Engineer" track

➢What's coming

- Update to Risk Management CLM (and PMT 250 module)
- New CLMs for MOSA (Open Systems), M&S in T&E, and Trade Studies

Top 10 Emerging Systemic Issues

1. Management	• IPT roles, responsibilities, authority, poor communication • Inexperienced staff, lack of technical expertise
2. Requirements	• Creep/stability • Tangible, measurable, testable
3. Systems Engineering	• Lack of a rigorous approach, technical expertise • Process compliance
4. Staffing	• Inadequate Government program office staff
5. Reliability	• Ambitious growth curves, unrealistic requirements • Inadequate “test time” for statistical calculations
6. Acquisition Strategy	• Competing budget priorities, schedule-driven • Contracting issues, poor technical assumptions
7. Schedule	• Realism, compression
8. Test Planning	• Breadth, depth, resources
9. Software	• Architecture, design/development discipline • Staffing/skill levels, organizational competency (process)
10. Maintainability/Logistics	• Sustainment costs not fully considered (short-sighted) • Supportability considerations traded

Major contributors to poor program performance

Systems Engineering Plan Trends

- What's working:
  - Programs beginning to establish SE WIPTs early in the life cycle to develop and document their technical planning
  - Increased Program Executive Office level Lead/Chief Systems Engineers involvement in SEP development
  - Movement to event-driven versus schedule-driven programs
    - More focus entry and exit criteria for technical reviews
- What needs work:
  - Firming up technical planning prior to RFP release
  - Proposed processes for a program not always tailored to fit program
    - Often appear to be copied from a manual or guide.
  - SEP author is someone in program office (contractor or junior person) who is not familiar with the technical strategy.
  - SEPs need to be consistent with key program documents